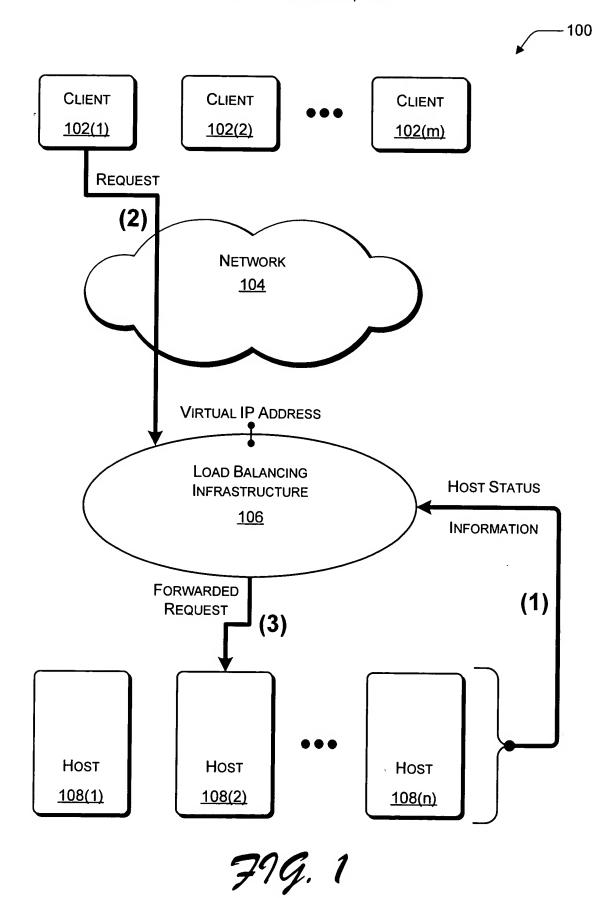
Docket No: MS1-1517US 1 of 40 Inventor(s): Gbadegesin et al. Title: Network Load Balancing

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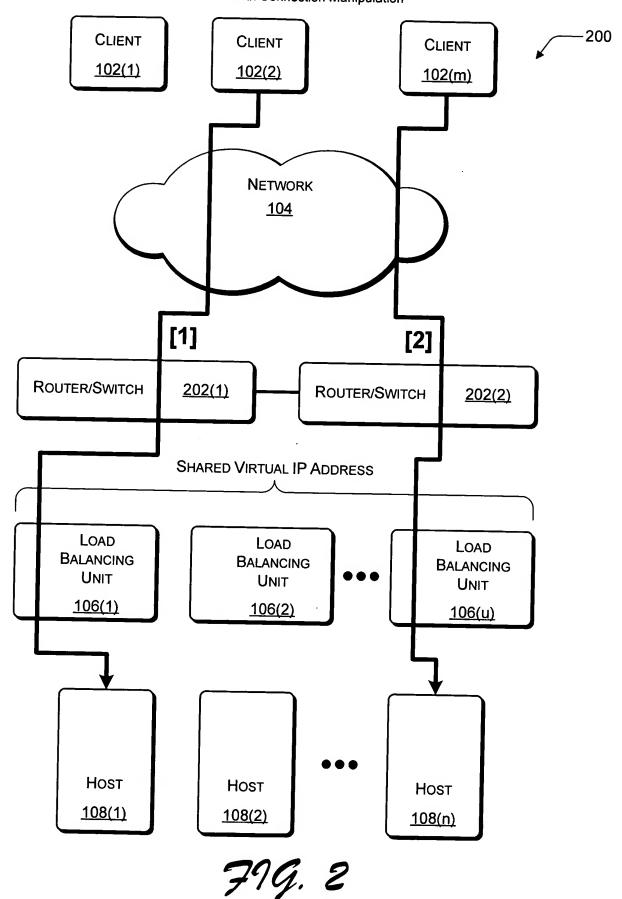
with Connection Manipulation



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Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation



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FORWARDER CLASSIFIER 302 304	REQUEST ROUTER 306
SESSION TRACKER	308
CONNECTION MIGRATOR	310
TUNNELER	<u>312</u>
HEALTH AND LOAD HANDLER	<u>314</u>
LOAD BALANCING UNIT 106	

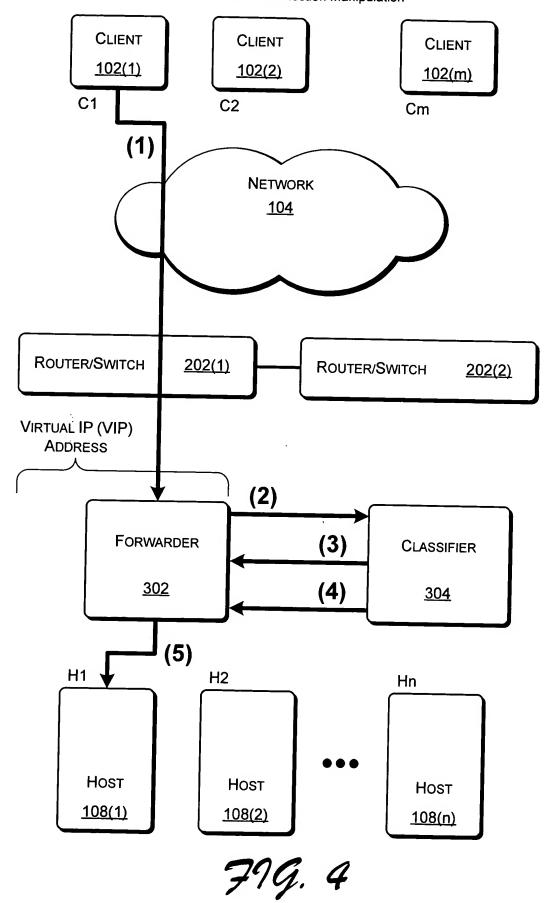
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Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
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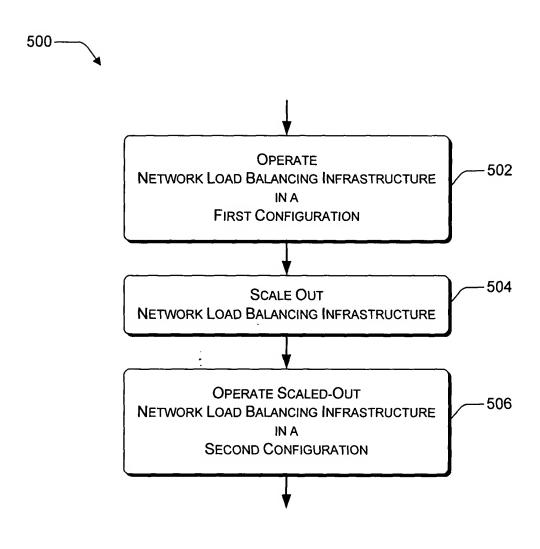


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Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation

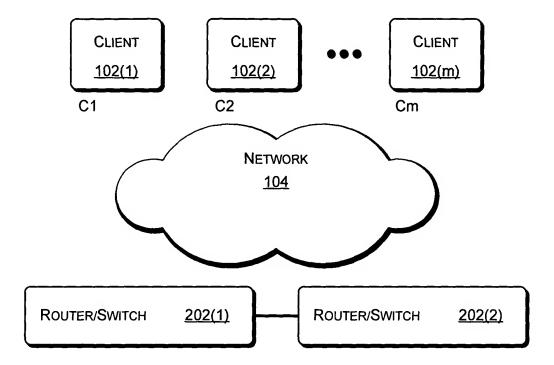
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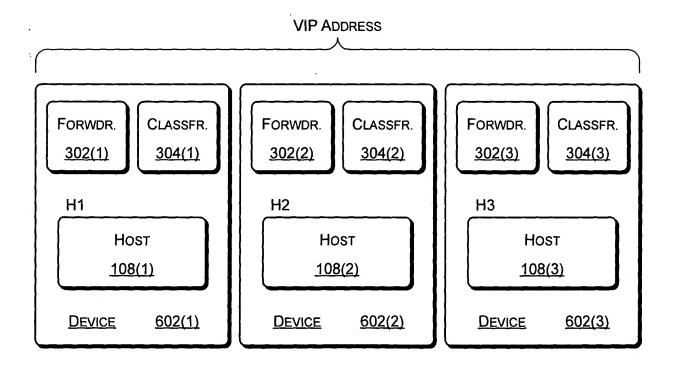


Docket No: MS1-1517US 6 of 40 Inventor(s): Gbadegesin et al. Title: Network Load Balancing

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with Connection Manipulation



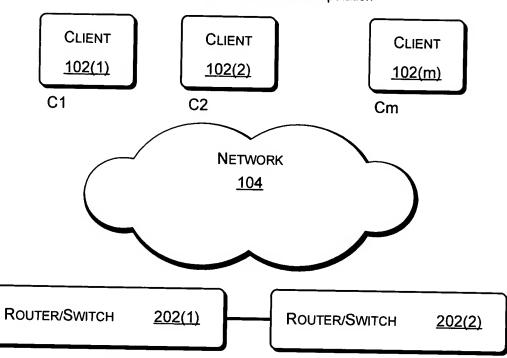


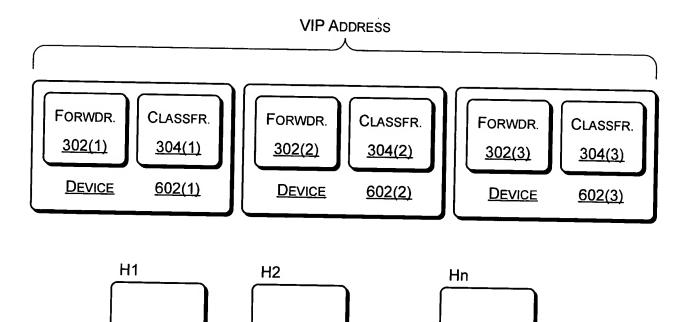
Docket No: MS1-1517US 7 of 40

Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation

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799.7

Host

108(n)

Host

108(2)

Host

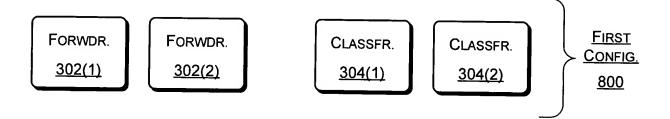
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Docket No: MS1-1517US 8 of 40

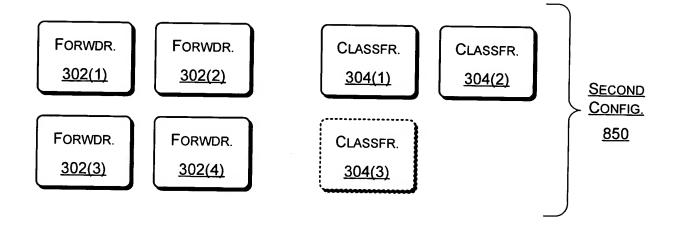
Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation

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77G. 8A

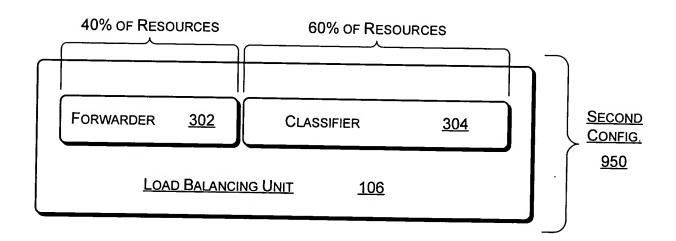


Docket No: MS1-1517US 9 of 40 Inventor(s): Gbadegesin et al. Title: Network Load Balancing

with Connection Manipulation

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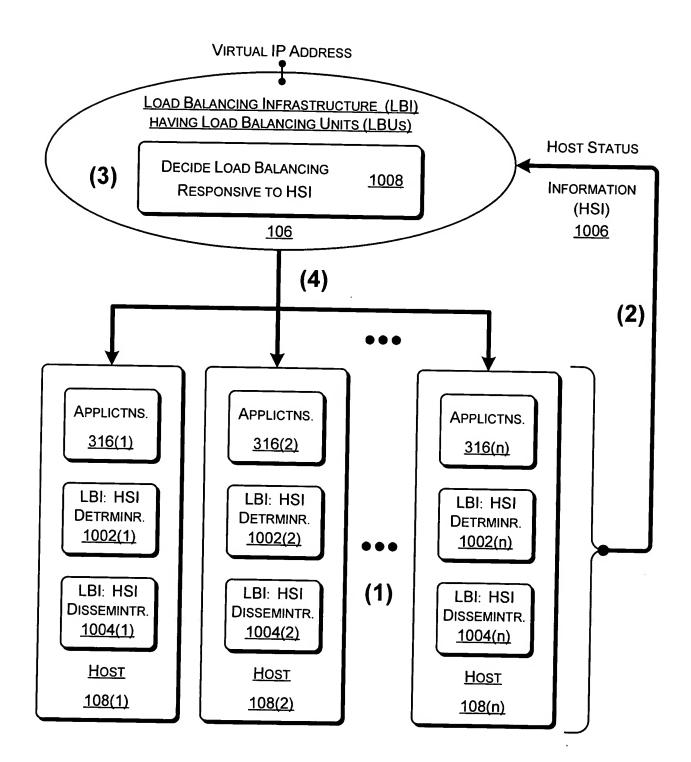
77G. 9A



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Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation

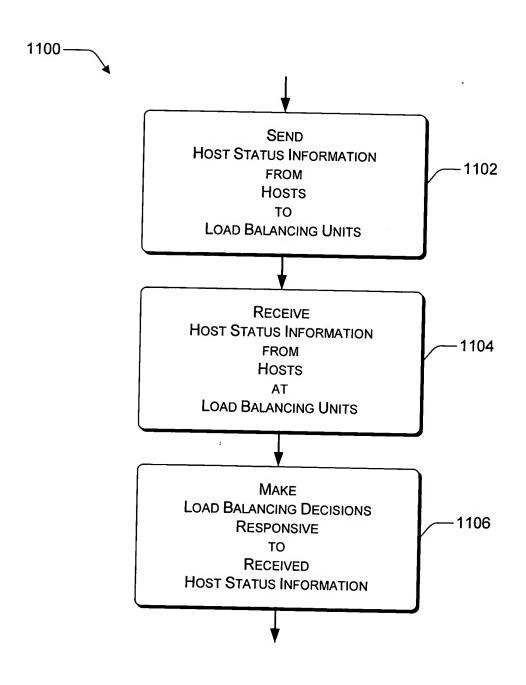


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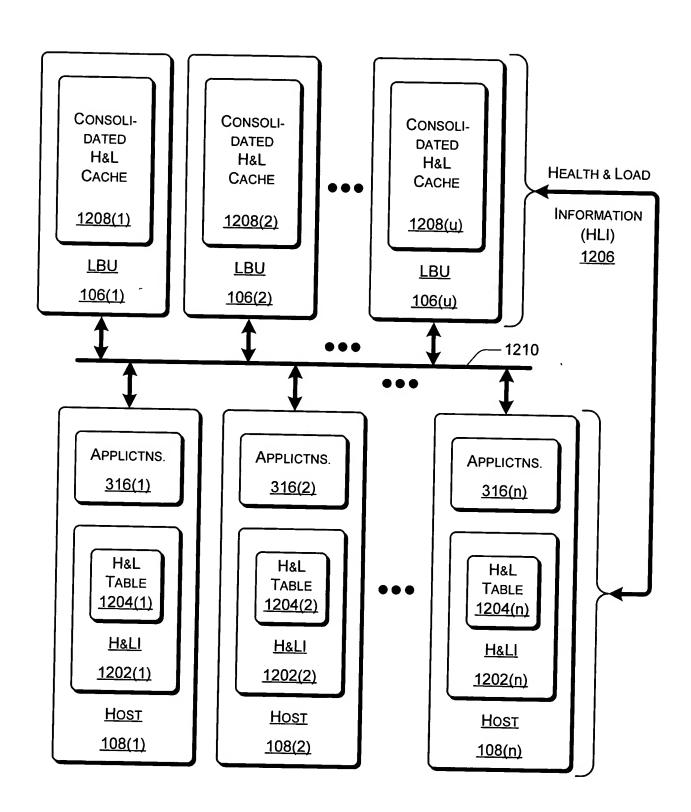
Docket No: MS1-1517US 11 of 40

Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation



799.11



799.12

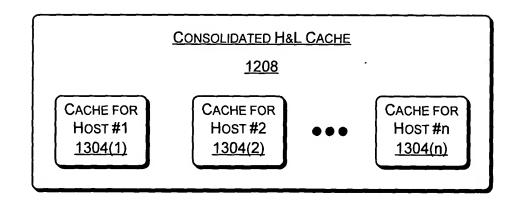
Docket No: MS1-1517US 13 of 40 Inventor(s): Gbadegesin et al.

Title: Network Load Balancing with Connection Manipulation

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H&L]	1204		
APPLICATION IDENTIFIER (ID)	APPLICATION STATUS CHARACTERIZATION	LOAD BALANCER DIRECTIVE	
<u>1302(A)</u>	<u>1302(B)</u>	<u>1302(C)</u>	
VIRTUAL IP ADDR. & PORT	APPLICATION HEALTH	TARGET LOAD BALANCING STATE	
PHYSICAL IP ADDR. & PORT	APPLICATION LOAD		
PROTOCOL		CURRENT LOAD BALANCING STATE	
PROTOCOL-SPECIFIC INFO.	APPLICATION CAPACITY		

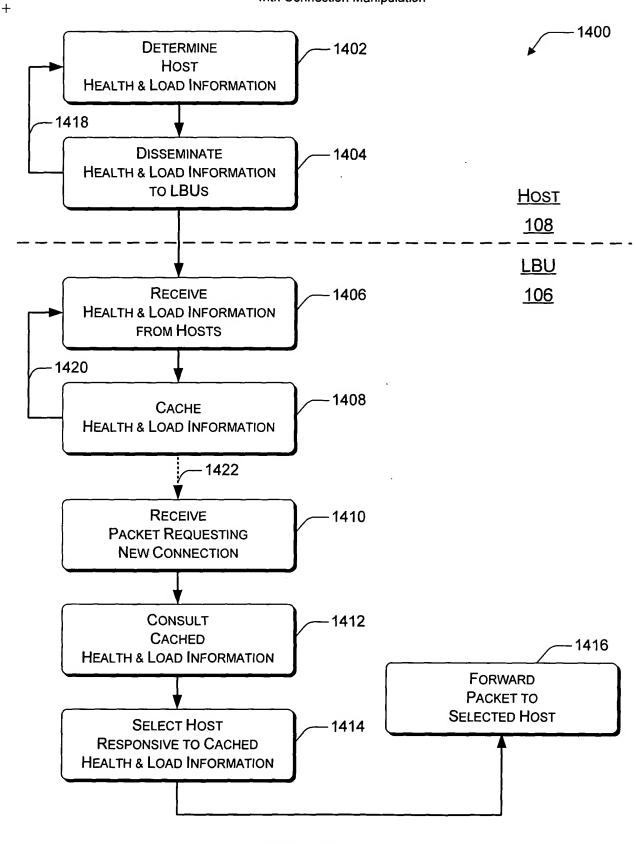
799. 13A



79G. 13B

Docket No: MS1-1517US 14 of 40 Inventor(s): Gbadegesin et al. Title: Network Load Balancing

with Connection Manipulation



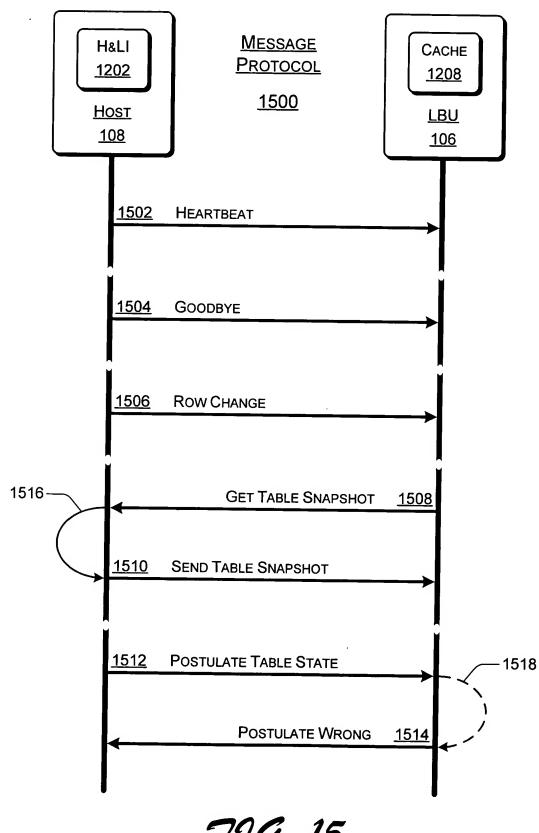
799.14

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Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation

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Docket No: MS1-1517US 16 of 40

Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation

+ CONSOLI-CONSOLI-CONSOLI-DATED DATED DATED H&L H&L H&L **CACHE CACHE** CACHE 1208(2) 1208(u) 1208(1) **LBU** <u>LBU</u> **LBU** 106(1) 106(2) 106(u) 1602(2) 1602(u) 1602(1) Host Host Host Host 108(1) 108(2) 108(3) 108(4) Host Host Host Host 108(5) 108(6) 108(7) 108(8) Host Host Host Host 108(9) 108(10) 108(11) 108(12) KEY:

KEY:
HEARTBEAT MEMBERSHIP
MESSAGES LINKS

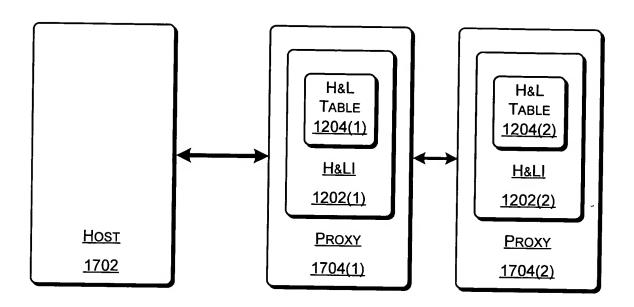
79G. 16

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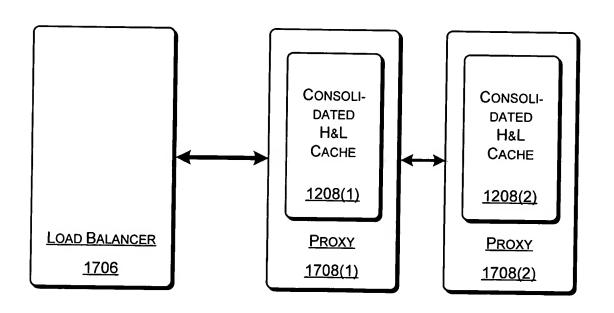
Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation

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79G. 17A

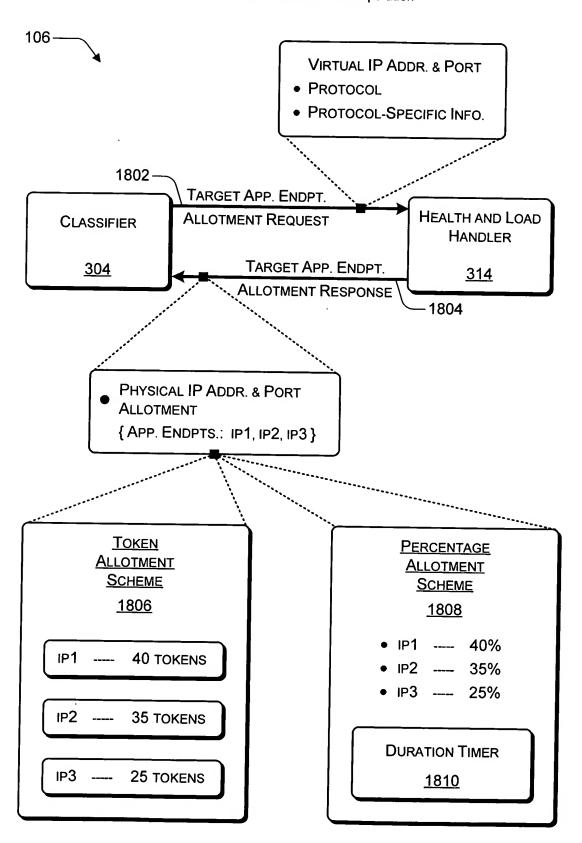


79G. 178

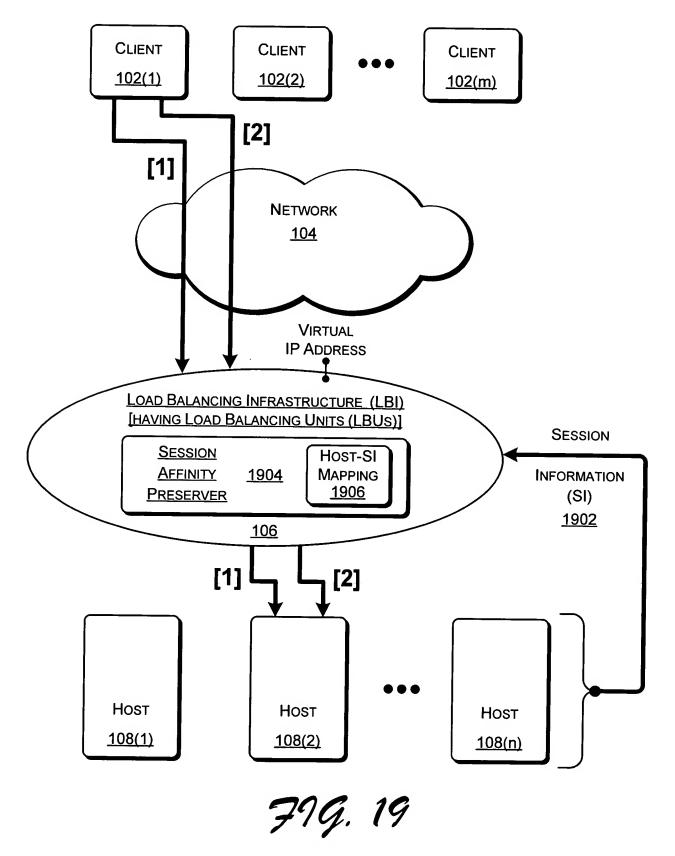
Docket No: MS1-1517US 18 of 40

Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
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79G. 18



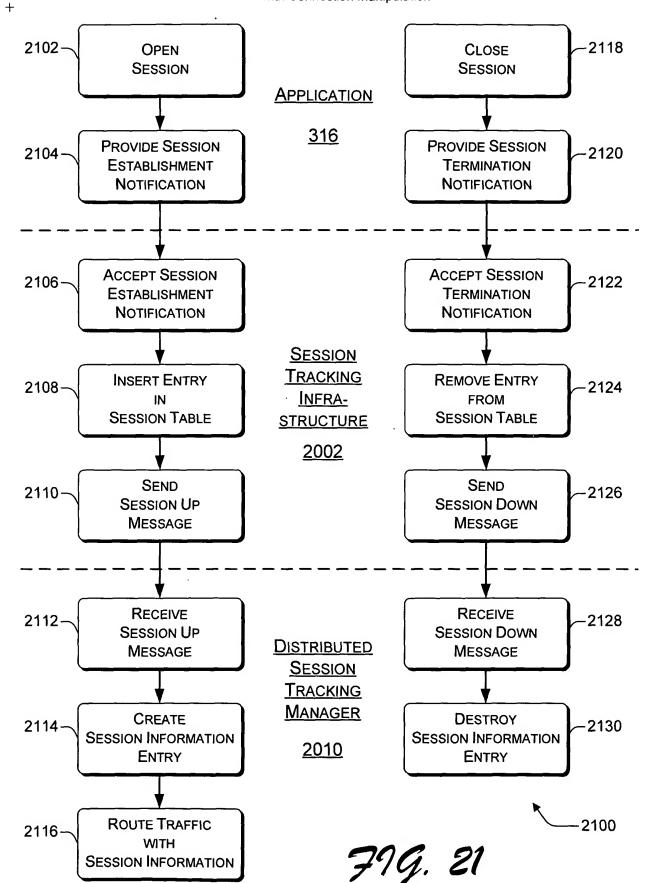
Docket No: MS1-1517US 20 of 40 Inventor(s): Gbadegesin et al.

Title: Network Load Balancing with Connection Manipulation

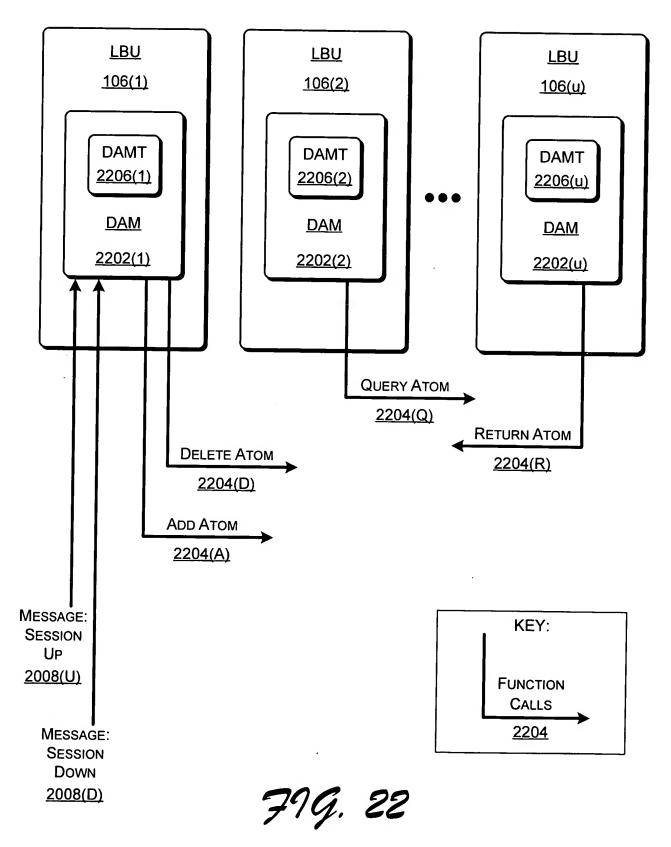
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LBU LBU <u>LBU</u> 106(1) 106(2) 106(u) TRAFFIC ROUTING **FUNCTIONALITY TRF TRF** (TRF) 2012(2) 2012(u) 2012(1) DISTRIBUTED SESSION 2010 2010 <u>2010</u> TRACKING MANAGER MESSAGE: MESSAGE: **SESSION SESSION** UР Down 2008(U) 2008(D) SESSION TRACKING **INFRASTRUCTURE (STI)** STI STI 2002(1) 2002(2) 2002(n) SESSION TABLE 2014(1) NOTECTN: NOTECTN: <u>API</u> SESSION SESSION 2004 ESTABLD. TERMTD. 2006(E) 2006(T) APPLICATION(S) APPS. APPS. 316(2) 316(1) 316(n) **HOST** <u>Host</u> **HOST** 108(1) 108(2) 108(n)

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	_				
2202(4)		<u>Session</u>	20	2014	
2302(1)—		SESSION IDENTIFIER	<u>2302(1I)</u>	SESSION TYPE/APPLIC.	2302(1T)
2302(2)		SESSION IDENTIFIER	2302(21)	SESSION TYPE/APPLIC.	2302(2T)
2302(v)—			•		
2302(V)—		SESSION IDENTIFIER	2302(vI)	SESSION TYPE/APPLIC.	2302(vT)

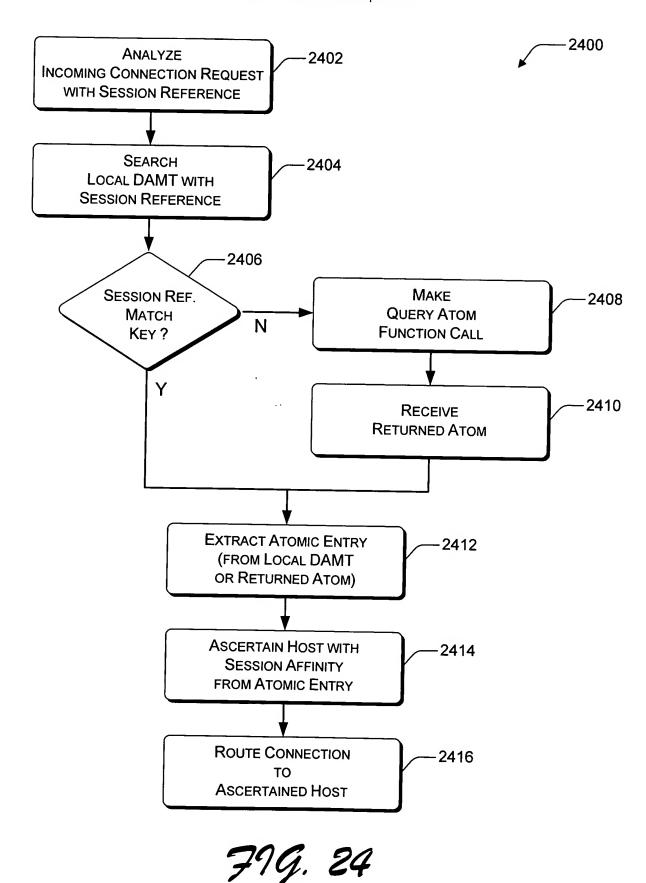
799. 23A

	_						
2204(4)	DISTRIBUTED ATOM MANAGER (DAM) TABLE (DAMT) 2206						2206
2304(1)—		KEY	2304(1K)	DATA	2304(1D)	METADATA	2304(1M)
2304(2)		KEY	2304(2K)	DATA	2304(2D)	METADATA	2304(2M)
2304(w)—							
2504(W)		KEY	2304(wK)	DATA	2304(wD)	METADATA	2304(wM)

Docket No: MS1-1517US 24 of 40 Inventor(s): Gbadegesin et al. Title: Network Load Balancing

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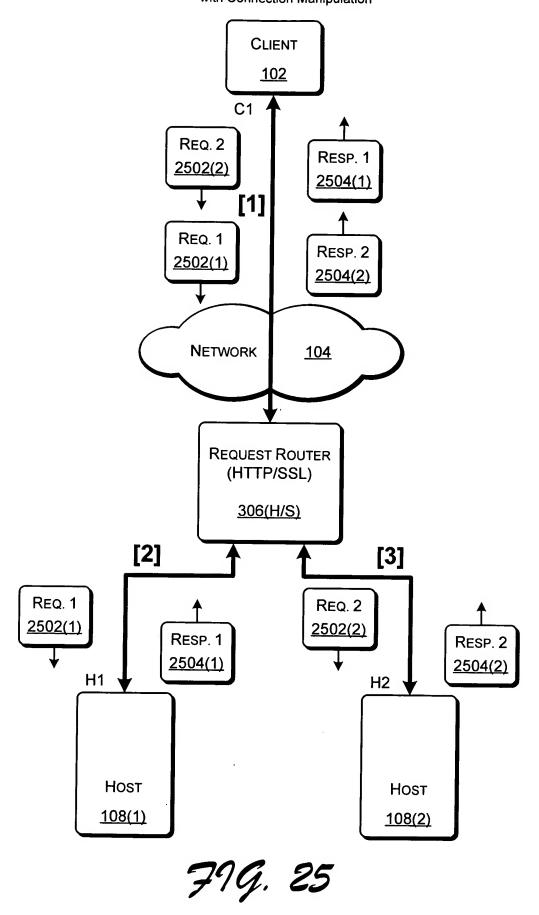
with Connection Manipulation



Inventor(s): Gbadegesin et al.

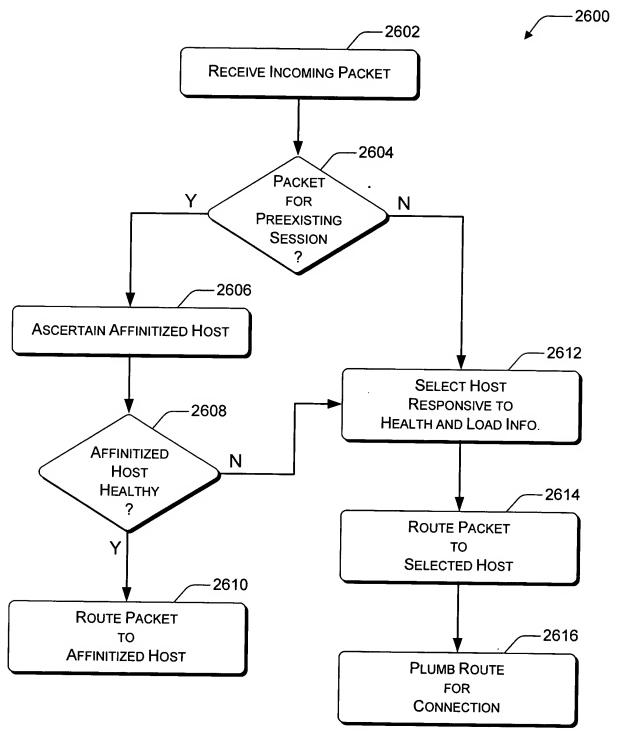
Title: Network Load Balancing
with Connection Manipulation

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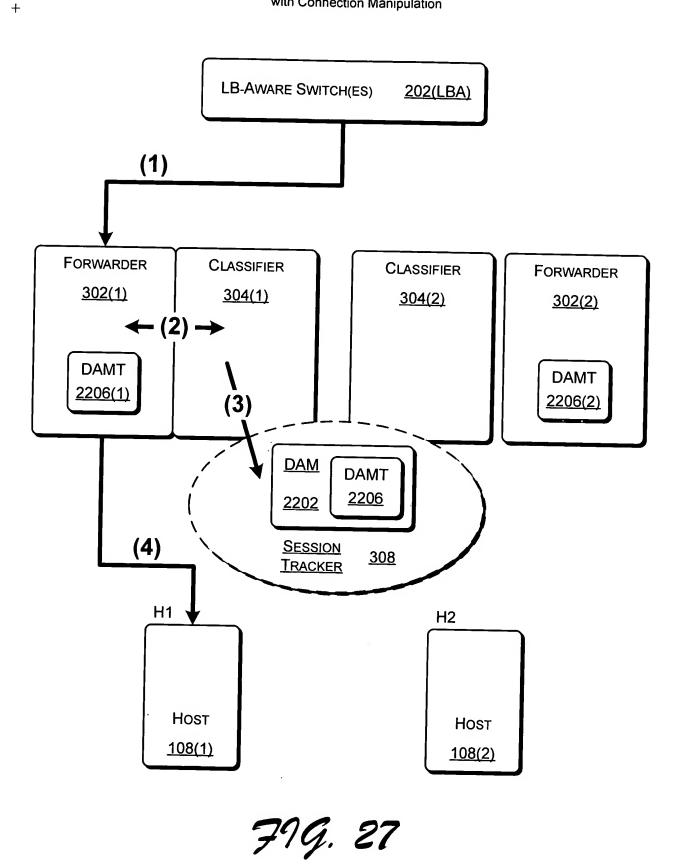
Docket No: MS1-1517US 26 of 40 Title: Network Load Balancing

Inventor(s): Gbadegesin et al. with Connection Manipulation +

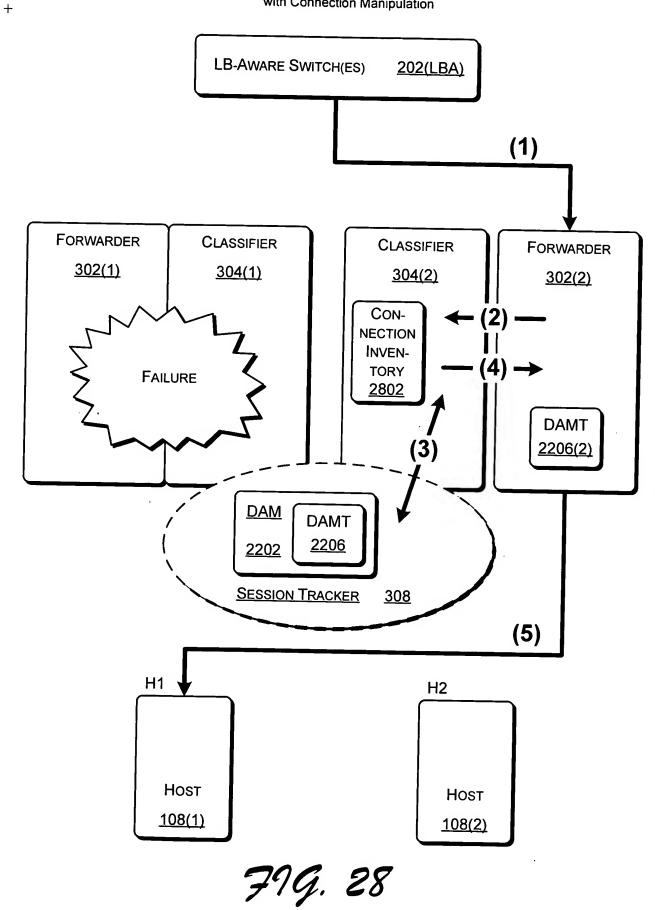


799. 26

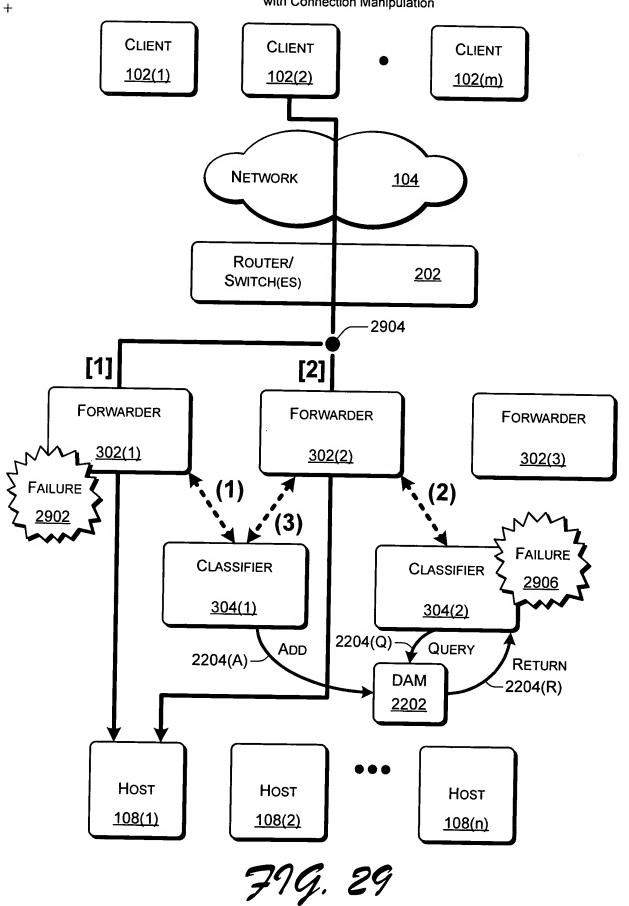
Docket No: MS1-1517US 27 of 40



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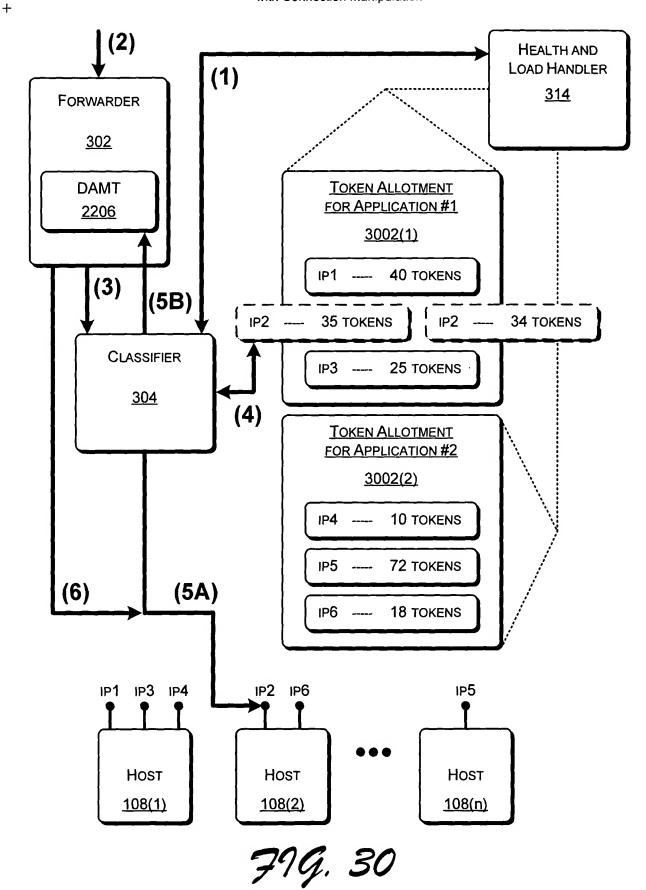


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Title: Network Load Balancing with Connection Manipulation

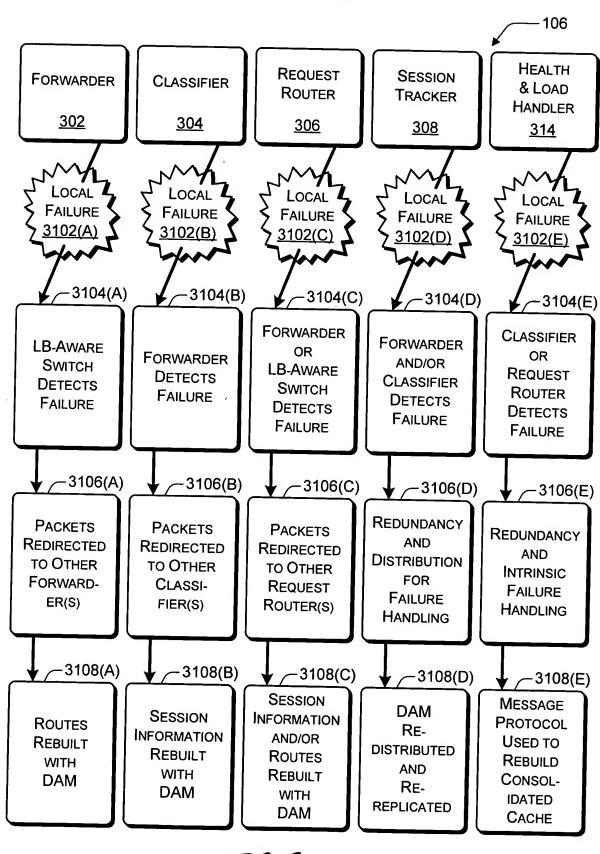


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Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation

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Docket No: MS1-1517US 32 of 40 Inventor(s): Gbadegesin et al.

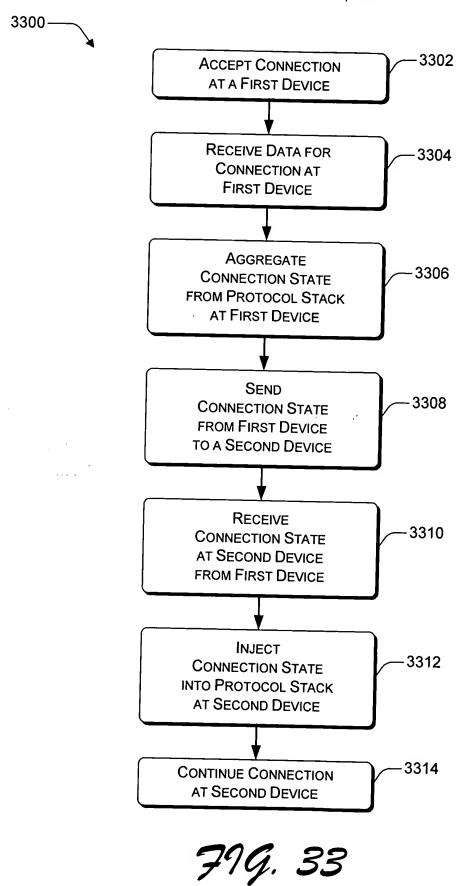
Title: Network Load Balancing with Connection Manipulation

+ **CLIENT** CLIENT **CLIENT** 102(1) 102(2) 102(m) C1 C2 Cm **N**ETWORK <u>104</u> (1) ROUTER/ 202 SWITCH(ES) VIRTUAL IP (VIP) CONNECTION **ADDRESS MIGRATOR** <u>310</u> (2) **TUNNELER** (3,4)<u>312</u> **FORWARDER** (5,6)CLASSIFIER TUNNELER **(7)** <u>302</u> 312 304 F (8) H1 H2 Hn Host Host Host 108(1) 108(2) <u>108(n)</u> 799.32

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Inventor(s): Gbadegesin et al.

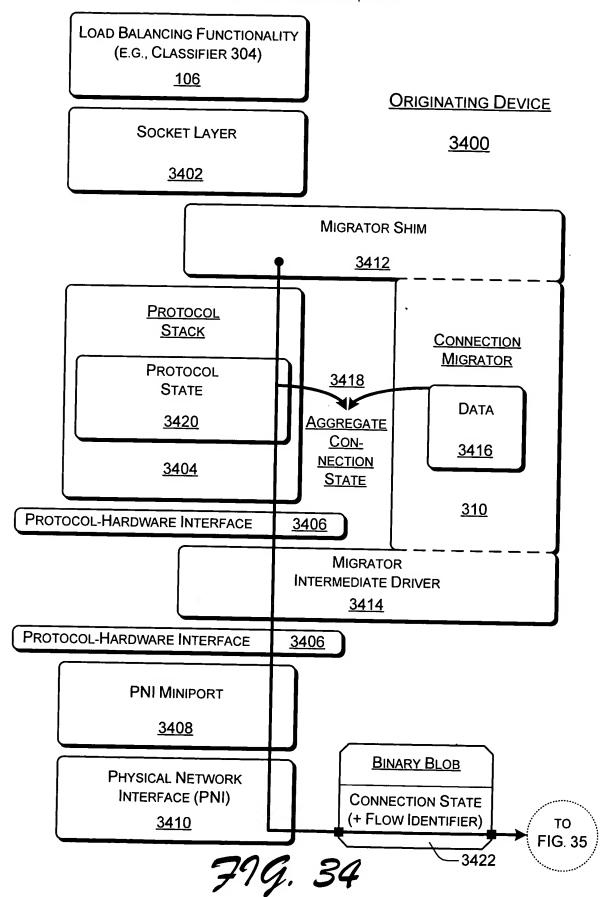
Title: Network Load Balancing
with Connection Manipulation



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Inventor(s): Gbadegesin et al.

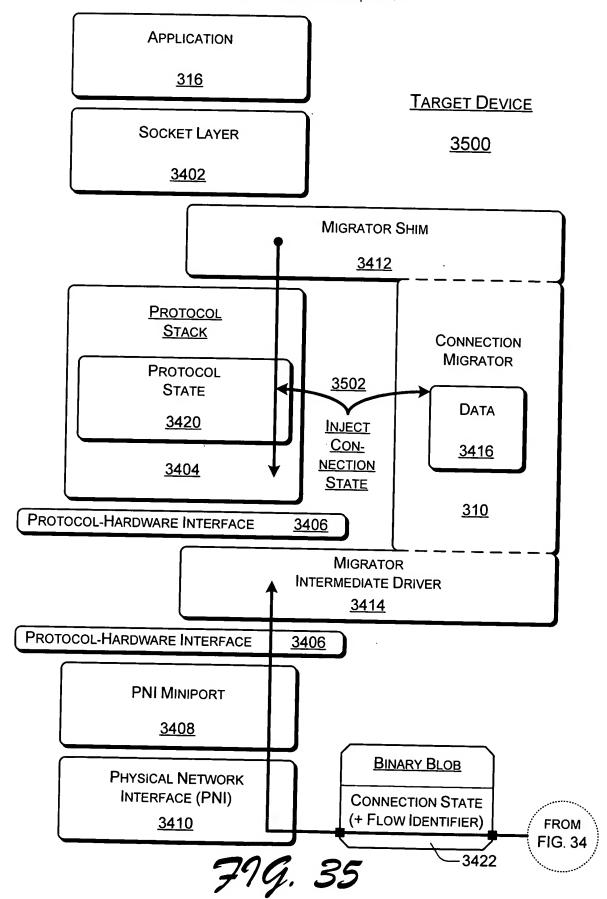
Title: Network Load Balancing
with Connection Manipulation



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Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
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Inventor(s): Gbadegesin et al.

Title: Network Load Balancing
with Connection Manipulation

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MIGRATION OFFLOADING SOCKET LAYER **PROCEDURE** 3600 3402 MIGRATOR SHIM <u>3412</u> <6> <3> **TCP** 3404(T) CONNECTION **MIGRATOR** IP 3404(I) 3404(A) **ARP** <4> <5> PROTOCOL-HARDWARE INTERFACE 3406 <u>310</u> **MIGRATOR** <1> INTERMEDIATE DRIVER <u>3414</u> PROTOCOL-HARDWARE INTERFACE <u>3406</u> **PNI MINIPORT** <u>3408</u>

799.36

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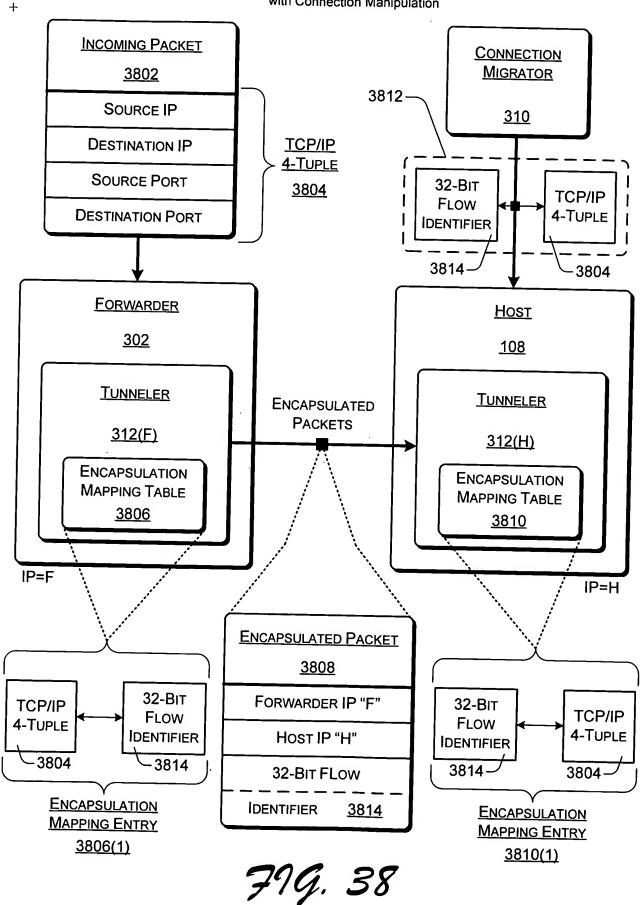
Title: Network Load Balancing with Connection Manipulation

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MIGRATION UPLOADING PROCEDURE SOCKET LAYER 3700 3402 <6> <4> MIGRATOR SHIM <u>3412</u> <8> **TCP** 3404(T) CONNECTION **MIGRATOR** IΡ 3404(I) 3404(A) **ARP** <5> PROTOCOL-HARDWARE **INTERFACE** <u>3406</u> 310 **MIGRATOR** <1>< INTERMEDIATE DRIVER <u>3414</u> PROTOCOL-HARDWARE INTERFACE <u>3406</u> <2> **PNI MINIPORT** <u>3408</u>

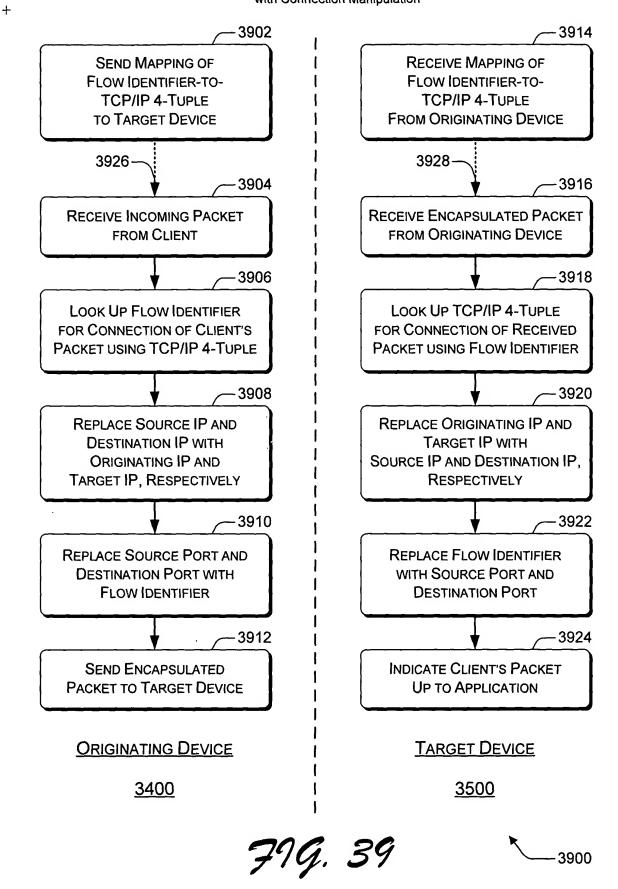
799.37

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Title: Network Load Balancing with Connection Manipulation



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